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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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08/913,518 11/04/97 DEBALME

J 1247-709-3VF

EXAMINER

IM22/0623

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ART UNIT

PAPER NUMBER

1733

DATE MAILED:

06/23/00

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.

08/913,518

Applicant(s)

DEBALME ET AL

Examiner

Jeff H. Aftergut

Group Art Unit

1733



☒ Responsive to communication(s) filed on May 15, 2000

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire THREE month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claims

☒ Claim(s) 1 and 5-14 is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 1 and 5-14 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been  
☐ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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***Claim Rejections - 35 USC § 103***

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 1, 5-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Francis (newly cited) in view of O'Connor optionally further taken with PCT WO 90/14457.

Francis taught a process and device for forming a composite product by associating glass fibers (column 3, lines 68-69) and thermoplastic, "potentially adhesive" fibers column 2, lines 50-55, for example) together. The reference taught that one deposited upon a moving conveyor 3 a fabric 2 from a spool supply 2a. The fabric 2 was a woven or knitted material which included a mixture of both potentially adhesive thermoplastic fibers and non-adhesive fibers, see column 2, lines 27-34. The reference to Francis taught that upon this fabric which was disposed upon the moving conveyor 3 one deposited a layer of commingled potentially adhesive fibers and non-adhesive fibers in chamber 9. The fibers which were commingled together within the chamber were chopped fibers of glass and thermoplastic material. The reference taught that the potentially adhesive thermoplastic fibers only made up 5-45% of the finished product (and thus suggested that at least 40% of the finished product was formed from glass fiber), see column 11, lines 8-16. The reference taught that assembly of fiber layers including the fabric formed from the reinforcing fibers and the potentially adhesive fibers as well as the non-woven mat assembled thereon formed from the commingled fibers was fed through a number of zones wherein the assembly was

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subjected to heat and then cooled while the entire arrangement was being compressed, see column 9, lines 14-54. The reference taught the basic process as claimed, but failed to envision that one would have employed commingled fibers for both the fabric as well as the chopped fibers of the nonwoven web which was disposed upon the conveyor. Additionally, the reference failed to suggest that one would have taken the material up subsequent to the pressing operation or cut the same into discrete lengths after the pressing operation.

However, the inclusion of commingled fibers in both the nonwoven as well as the woven fabric layer in Francis would have been obvious to those skilled in the art in order to ensure adequate contact between the potentially adhesive fibers of the thermoplastic material and the non-adhesive glass fibers in the composite article as suggested by O'Connor. O'Connor taught that one skilled in the art would have employed commingled filaments of thermoplastic and reinforcing filaments in order to ensure adequate contact between the thermoplastic and reinforcing filaments (and better wetting of the reinforcing filaments when heat and pressure was applied) to form woven and nonwoven laminates of reinforcing filaments and thermoplastic filaments. More specifically, O'Connor suggested that by commingling the thermoplastic filaments with the reinforcing filaments one was able to attain intimate contact between the thermoplastic fibers which form the matrix and the reinforcing fibers and a more even and uniform impregnation of the reinforcing filaments. The applicant is referred to column 1, lines 27-31, column 1, lines 45-57. The reference taught that commingling of the thermoplastic filaments and the reinforcing filaments would have been performed in the manufacture of both nonwoven and

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woven fiber layers. The reference taught that in the formation of a nonwoven with the commingled yarns one would have chopped the same and deposited the short fibers together to form a mat or batt. O'Connor taught that as an alternative to the chopped bat of commingled fibers, a fabric formed from the commingled yarns would have been suitable and additionally a fabric formed from yarns where one yarn type used was a thermoplastic yarn and the other yarn type used was a reinforcing yarn which was woven together into a fabric (note that this is similar in nature to the fabrics of U.K. '768). The reference suggested that one would have desired intimate contact between the reinforcing filaments and the thermoplastic filaments and that one useful way for achieving the same would have been to commingle the filaments of thermoplastic and reinforcing materials together and utilize the same to either form a woven fabric or a nonwoven wherein subsequent to the formation one would have applied heat and pressure to the same in order to form a composite article. Because it would have ensured a better impregnation with the matrix, it would have been within the purview of the ordinary artisan to employ the mingling techniques of O'Connor in the process of Francis. While the reference to Francis failed to teach that one cut the finished product or stored the same on a reel subsequent to formation of the continuous product, such is taken as conventional in the art at the time the invention was made. It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the commingled filaments of O'Connor in the process of Francis in order to attain superior contact of the meltable adhesive fibers (which formed a matrix for holding the product together) with the glass fibers of the reinforcement.

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It should be noted that Francis taught various alternatives which were useful in formation of the composite articles including application of the fabrics first upon the conveyor as well as application of the fabric onto the conveyor bearing the chopped fiber layers. The reference taught that any number of fabric layers would have been useful including the use of plural fabric layers disposed between alternating, see Figures 3-5, column 10, line 65-column 11, line 7. It should be additionally noted regarding claims 13 and 14 that the use of two separate supplies for the fabric layer (wherein the same was used to supply additional fabric in the production line when the initial supply was depleted such that one was able to continue the production of the composite without having to stop the process line) was taken as conventional in the art and would have been provided by the ordinary artisan in order to maintain the production operation (where the old exhausting supply was spliced to the new supply in order to maintain continuous production). Additionally, the use of a preheater in order to heat the material prior to passing into the double band press is taken as conventional in the art and would have been included in the device to reduce the heating requirements of the press as well as speed up the production rate of the process.

While it is believed that Francis taught all of the critical elements of the claimed invention and that the use of commingled filaments would have been obvious in light of O'Connor, the reference to PCT '457 is cited to show that those skilled in the art would have understood that a suitable guillotine would have been included in the device at the end of the double band press (note above such was taken as conventional in the art). The reference to PCT '457 suggested that

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one would have included a cutting mechanism 12 at the end of the double band press 11 where a layer of nonwoven glass fibers and thermoplastic fibers have been consolidated under heat and pressure and cooled under pressure to form a composite web. The cutting was to provide the desired length for the finished product. It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the techniques of Francis to form a composite article from glass fibers and adhesive thermoplastic fibers which were commingled according to the suggestion of O'Connor and wherein subsequent to compaction and application of heat and cooling one cut the same to a desired length in order to achieve a finished composite article.

***Response to Arguments***

3. Applicant's arguments with respect to claims 1 and 5-14 have been considered but are moot in view of the new ground(s) of rejection.


The applicant is advised that the reference to Francis suggested that one would have employed a continuous operation for forming the composite material wherein the layers were provided upon a moving conveyor as claimed.

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*Conclusion*

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeff Aftergut whose telephone number is (703) 308-2069.

JHA  
June 22, 2000

  
**JEFF AFTERGUT**  
**PRIMARY EXAMINER**  
**ART UNIT 1733**